The matrix glass is melted, clarified and homogenized in a crucible, into which the light-storage self-luminescent material is added. Then the system is mixed well using a 1Cd18Ni9Ti rod, secondarily clarified, and pressed into an integrally luminous glass ashtray.

After being illuminated under sunshine or lamplight for 10 min, the obtained ashtray can self-emit blue-green light in the dark for over 8 hrs.

The above process can also be applied to the light-storage self-luminescent materials 1, 2 and 4 having a particle size of from 30 to 80 μm for press forming light-storage self-luminescent glass articles in various shapes.

Example 9

Starting materials: low melting point glass comprising (wt%):

SiO_2: 29%	Al_2O_3: 1%
B_2O_3: 33%	Li_2O: 5%
Na_2O: 9%	TiO_2: 17%
CaO: 5%	SrO: 1%;

Light-storage self-luminescent material 2 ($Sr_2MgSi_2O_7$:$Eu_{0.05}Dy_{0.05}$) having a particle size of from 30 to 50 μm.

The low melting point glass is melted, cooled down and crushed to obtain 250-mesh glass powder. 80 g of the glass powder is mixed well with 20 g of the light-storage self-luminescent material and then the resultant mixture is melted at 850-900°C for 1.5 h in an air atmosphere in a furnace, moulded and annealed to obtain light-storage self-luminescent glass.

After being illuminated under sunshine or lamplight for 10 min, the obtained light-storage self-luminescent glass can self-emit blue light in the dark for over 10 hrs.

The above process can also be applied to the light-storage self-luminescent glass material 5.

The light-storage self-luminescent glass obtained in the above process can be subject to deep processing such as knifing, cutting, drilling, polishing and grinding.

What we claim is:

1. Light-storage self-luminescent glass, comprising from 0.01% to 40% by weight of a light-storage self-luminescent material activated by multiple ions and from 99.99% to 60% by weight of a matrix glass; wherein the light-storage self-luminescent material has a particle size from 10 μm to 20 mm, and the matrix glass is low melting point glass or common silicate glass, and other conventional borate glass, phosphate glass, halide glass, sulfide glass and aluminate glass.

2. Light-storage self-luminescent glass according to claim 1, wherein the chemical formula of the light-storage self-luminescent material activated by

multiple ions is:

$$\alpha MO \cdot \beta M'O \cdot \gamma SiO_2 \cdot \delta R:Eu_xLn_y$$

wherein M is one or more selected from the group consisting of Sr, Ca, Ba and Zn;

M' is one or more selected from the group consisting of Mg, Cd and Be;

R is B_2O_3, P_2O_5 or mixture thereof;

Ln is one or more selected from the group consisting of Nd, Dy, Ho, Tm, La, Pr, Tb, Ce, Er, Mn, Bi, Sn and Sb; and

α, β, γ, δ, x and y are molar coefficients meeting following requirement: $0.6 \leq \alpha \leq 6$; $0 \leq \beta \leq 5$; $1 \leq \gamma \leq 9$; $0 \leq \delta \leq 0.7$; $0.00001 \leq x \leq 0.2$; $0 \leq y \leq 0.3$.

3. Light-storage self-luminescent glass according to claim 2, wherein the main chemical formula of the light-storage self-luminescent material activated by multiple ions is:

$$(Sr_{1-z}Ca_z)_2MgSi_2O_7:Eu_xLn_y$$

wherein Ln is one or more selected from the group consisting of La, Ce, Dy, Tm, Ho, Nd, Er, Sb and Bi;

z is a coefficient: $0 \leq z \leq 1$; and

x and y are molar coefficients: $0.0001 \le x \le 0.2$; $0.0001 \le y \le 3.0$.

4. Light-storage self-luminescent glass according to claim 1, wherein the chemical formula of the light-storage self-luminescent material activated by multiple ions is:

$(Ca_{1-z}Sr_z)S:Eu_xLn_y$

wherein Ln is one or more selected from the group consisting of Er, Dy, La, Tm and Y;

z is a coefficient: $0 \le z \le 1$; and

x and y are molar coefficients meeting following requirement: $0.00001 \le x \le 0.2$; $0.00001 \le y \le 0.15$.

5. Light-storage self-luminescent glass according to claim 1, wherein the chemical formula of the light-storage self-luminescent material activated by multiple ions is:

$R_2O_2S:Eu_xLn_y$

wherein R is one or more selected from the group consisting of Y, La and Gd;

Ln is one or more selected from the group consisting of Er, Cr, Bi, Dy, Tm, Ti, Mg, Sr, Ca, Ba and Mn; and

x and y are molar coefficients meeting following requirement: $0.00001 \le x \le 0.2$; $0.00001 \le y \le 0.6$.

6. Light-storage self-luminescent glass according to claim 1, wherein the chemical formula of the light-storage self-luminescent material activated by multiple ions is:

$$\alpha MO \cdot \beta Al_2O_3 \cdot \gamma B_2O_3{:}Eu_xLn_y$$

wherein M is one or more selected from the group consisting of Mg, Ca, Sr and Zn;

Ln is one or more selected from the group consisting of Nd, Dy, Ho, Tm, La, Ce, Er, Pr and Bi; and

α, β, γ, x and y are molar coefficients meeting following requirement: $0.5 \le \alpha \le 6$; $0.5 \le \beta \le 9$; $0 \le \gamma \le 0.3$; $0.00001 \le x \le 0.15$; $0.00001 \le y \le 0.2$.

7. Light-storage self-luminescent glass according to claim 6, the chemical formula of the light-storage self-luminescent material is:

$$MAl_2O_4{:}Eu_xLn_y$$

wherein Ln is one or more selected from the group consisting of La, Ce, Dy, Ho, Nd and Er;

M is one or more selected from the group consisting of Sr, Ca, Mg and Zn; and

x and y are molar coefficients: $0.0001 \leq x \leq 0.15$; $0.0001 \leq y \leq 0.2$.

8. Light-storage self-luminescent glass according to claim 6, wherein the chemical formula of the light-storage self-luminescent material activated by multiple ions is:

$M_4Al_{14}O_{25}:Eu_xLn_y$

wherein Ln is one or more selected from the group consisting of Pr, Ce, Dy, Ho, Nd and Er;

M is one or more selected from the group consisting of Sr, Ca, Mg and Zn; and

x and y are molar coefficients: $0.0001 \leq x \leq 0.15$; $0.0001 \leq y \leq 0.2$.

9.Light-storage self-luminescent glass according claim 1, wherein the low melting point glass consists of following components (by weight):

SiO_2: 10-45%	MgO: 0-8%
Al_2O_3: 1-5%	CaO: 2-10%
B_2O_3: 0-50%	SrO: 1-10%
Li_2O: 0-6%	BaO: 0-7%
Na_2O: 5-20%	ZnO: 0-10%

K_2O: 0-20% ZrO_2: 0-1%

TiO_2: 0-20%.

10. Light-storage self-luminescent glass according claim 1, wherein the conventional silicate glass consists of following components (by weight):

SiO_2: 30-81% CaO: 0.5-9%

Al_2O_3: 0-23% MgO: 1-8%

B_2O_3: 0-15% SrO: 1-10%

Li_2O: 0-8% BaO: 0-16%

Na_2O: 0.6-18% ZnO: 0.6-55%

K_2O: 0.4-16% PbO: 0-33%

As_2O_3: 0-0.5%.

11. A process for producing the light-storage self-luminescent glass according to claim 1, comprising formulating, mixing, melting and forming to obtain the light-storage self-luminescent glass.

12. A process for producing the light-storage self-luminescent glass according to claim 11, wherein the light-storage self-luminescent material is doped into the melted matrix glass to produce a mixture and the mixture is

formed at 900-1300°C during the forming process.

13. A process for producing the light-storage self-luminescent glass according to claim 11, wherein a glass which has been formed and cooled is re-heated and melted by a glass blower, and doped with the light-storage self-luminescent material before secondary forming.

14. A process for producing the light-storage self-luminescent glass according to claim 11, wherein the matrix glass is melted, homogenized and clarified to obtain a glass metal, the resultant glass metal is doped with 1-45% of a light-storage self-luminescent material to produce a mixture, and the mixture is mixed well and then secondarily clarified before forming.

15. A process for producing the light-storage self-luminescent glass according to claim 11, wherein the low melting point glass is melted, cooled down and crushed to obtain glass powder; the glass powder is thoroughly mixed with a light-storage self-luminescent material to obtain a mixture; and then the resultant mixture is heat treated at the temperature of 700-1100℃ to obtain the light-storage self-luminescent glass.